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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/531,794	04/18/2005	Jan Lindskog	P16950-US1	2309

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EXAMINER	
NEFF, MICHAEL R	

ART UNIT	PAPER NUMBER
2611	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/531,794	LINDSKOG ET AL.	
	Examiner	Art Unit	
	MICHAEL R. NEFF	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 March 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *14,15 and 19-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *14, 15, 19-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. The office action is in response to the remarks and amendments filed on 3/26/2008. The Examiner acknowledges that a separate and correct abstract has been filed by the applicant, and than claims 14, 15, and 19-23 remain pending in the application after the cancellation of claims 16-18 and 24-26.

2. Applicant's arguments filed 3/26/2008 have been fully considered but they are not persuasive. The Examiner has thoroughly reviewed the Applicant's arguments but firmly believes that the cited references reasonably nad properly meet the claimed limitations as rejected.

Applicant's arguments: "There is no teaching in those portions of Kim, much less the remainder of that document, of "[inserting] a control word indicative of the pilot configuration associated with a subsequent frame or a particular frame of a subsequent given order number... into [a] frame and coded on a predetermined payload channel."

Examiner's response: Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

Regarding the limitation argued above by the Applicant, the Examiner directs the applicant to the original points of rejection. Within Paragraphs 00008-0010, as previously cited, Kim provided disclosure of what is to be considered well known

to those of ordinary skill in the art. Within this disclosure, Kim specifically describes a pilot controller (control word for the pilot) which uses previous pilot controlling configurations shifted to be utilized at the present time. This control word is specifically used to add controlled pilots to sub-channels. The following citations within the prior art are used to cite the disclosure of Kim which the Examiner interprets as Kim using these methods which have been previously disclosed as well known in the art. When the disclosure taken as a whole with the other prior arts of record, the Examiner maintains that this disclosure within the prior art reasonably and completely encompasses the claim limitations under discussion.

The following is a revised version of the previous office action to address the amendments made by the applicant.

Claim Rejections - 35 USC § 102

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 14, 21, 22 are rejected under 35 U.S.C. 102(e) as being anticipated by Kim et al. (herein after Kim) (US Publication 2002/0172184 A1).

Re Claim 14, Kim discloses a method of communicating consecutive frames of digital data, said method comprising the steps of:

mapping payload data into complex symbols (101-104; Paragraphs 0008-0009; Figure 2 and Paragraph 0054-0055);

interspersing appropriate pilot symbols (105, 106, 210, 211); and,

mapping symbols on respective sub-channels (107, 212, 213);

whereby the insertion of a given pilot configuration into the stream of payload data will give rise to a specific output signal being associated with a given PAPR value (219; Paragraphs 0021, 0057);

wherein the digital data comprises OFDM modulated signals comprising a first plurality of payload carrying sub-channels and a second plurality of pilot carrying sub channels (Figure 5-8; Paragraphs 0008-0010, 0042-0052 and further discussion of these embodiments);

wherein each individual frame of payload data to be transmitted over the payload channels is associated with a given unique pilot configuration chosen from a sub-set of predetermined pilot configurations, each pilot configuration forming a unique pattern of predetermined pilot symbols and transmitted (Figure 2, 209, 211, 210, 212-215; Paragraph 0056);

wherein, prior to the transmission of at least one given frame of payload data, each pilot configuration of the sub-set is evaluated with regard to PAPR for the associated frame of payload data, whereby the pilot configuration being associated with the lowest PAPR value is chosen for transmission (219, 220, Paragraphs 0057-0058); and wherein a control word indicative of the pilot configuration associated with a subsequent frame or a particular frame of a subsequent given order number is inserted

into the frame and coded on a predetermined payload channel (210-217; Paragraph 0008-0010, 0021, 0054-0056).

Re Claim 21, Kim discloses the method according to claim 14, wherein the sub-channels are modulated by BPSK or n-QAM modulation (Paragraph 0009).

Re Claim 22, Kim discloses a transmitter comprising:

a mapping stage (212-215),

mapping payload data on a subset of a plurality of frequency orthogonal sub-carriers (Paragraph 0054-0058);

a plurality of parallel-coupled pilot insertion stages coupled to the mapping stage (210 and 211),

each pilot insertion stage inserting a unique pilot configuration on at least another subset of sub-carriers (210-211, paragraph 0057);

a respective inverse fast Fourier transmission stage processing signals from each respective pilot insertion stage (218);

a PAPR measuring and pilot decision stage (219, 220),

measuring and evaluating PAPR for each unique pilot configuration (219);

wherein, each individual frame of payload data to be transmitted over the payload channels is associated with a given unique pilot configuration chosen from a sub-set of predetermined pilot configurations, each pilot configuration forming a unique

pattern of predetermined pilot symbols, and transmitted (Figure 2, 209, 211, 210, 212-215; Paragraph 0056); and,

wherein, prior to the transmission of at least one given frame of payload data, each pilot configuration of the sub-set is evaluated with regard to PAPR for the associated frame of payload data, whereby the pilot configuration associated with the lowest PAPR value is chosen for transmission (219, 220; Paragraphs 0057-0058) and;

said transmitter further comprising a control word insertion stage for inserting a control word in a transmitted frame, the control word being indicative of the pilot configuration used in a frame of any given subsequent order number. (210-217; Paragraph 0008-0010, 0021, 0054-0056).

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim.

Re Claim 19, Kim discloses the method according to claim 14, but fails to explicitly disclose wherein, the sub-carriers carrying the pilot signals are digitally modulated at a lower order (BPSK) than sub-carriers carrying the payload data (QAM).

However Kim does disclose the knowledge to use both modulation forms (BPSK and QAM) within the disclosed communication system. The Examiner reads this as disclosing the ability to apply the different modulation schemes to the various aspects of

the transmitted signal, provided that the appropriate demodulation methods are prepared (Paragraph 0009 and 0057).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the modulation techniques disclosed by Kim in a manner that allows for aspects of the transmission signal to be modulated in different modulation schemes in order to gain the benefit of utilizing the most efficient bit to symbol ratio for the system.

6. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim in view of Stevenson (US Patent 6,209,112 B1).

Re Claim 15, Kim discloses the method according to claim 14, Kim further discloses the use of Reed-Solomon encoding which is a well known method of block coding for the purpose of error correction to one of ordinary skill in the art, however Kim fails to explicitly disclose wherein the plurality of pilot configurations represent block codes allowing error correction at the receiver.

This method is however disclosed by Stevenson. Stevenson discloses a communication system wherein the pilot configurations represent block codes allowing error correction at the receiver (Col. 4 lines 8-21).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the use of block coding for assistance in the process of error correction as disclosed by Stevenson with the communication method

disclosed by Kim in order to gain the benefit of a reduced number of signal errors in the receiver.

7. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim in view of Khandani et al. (herein after Khandani) (US Publication 2004/0093545 A1).

Re Claim 23, Kim discloses the transmitter according to claim 22, but fails to explicitly disclose wherein each unique pilot configuration has a hamming distance of at least three to any other pilot configuration.

This design is however disclosed by Khandani. Khandani discloses a PAPR based system wherein the block codes transmit with a hamming code value of 3 (Paragraph 0189).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, given that the desire to have a large hamming distance to increase the amount of error correction possible for a signal, to incorporate the disclosure of Khandani with that of Kim to gain the benefit of designing the coding to function at high rate of efficiency within a system that focuses on the signal PAPR.

8. **Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim and Stevenson as applied to claim 15 above and further in view of Khandani.**

Re Claim 20, Kim discloses the method according to claim 15, but fails to explicitly disclose wherein each unique pilot configuration has a hamming distance of at least three to any other pilot configuration.

This design is however disclosed by Khandani. Khandani discloses a PAPR based system wherein the block codes transmit with a hamming code value of 3 (Paragraph 0189).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, given that the desire to have a large hamming distance to increase the amount of error correction possible for a signal, to incorporate the disclosure of Khandani with that of Kim to gain the benefit of designing the coding to function at high rate of efficiency within a system that focuses on the signal PAPR.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL R. NEFF whose telephone number is

(571)270-1848. The examiner can normally be reached on Monday - Friday 8:00am - 4:30pm EST ALT Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on (571)272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MICHAEL R. NEFF/
Examiner, Art Unit 2611
/Shuwang Liu/
Supervisory Patent Examiner, Art Unit 2611